

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KAZUHITO YANADORI

Appeal 2007-2852
Application 10/691,583
Technology Center 1700

Decided: November 26, 2007

Before EDWARD C. KIMLIN, CHUNG K. PAK, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

1 This is an appeal from the decision of the Examiner finally rejecting of claims 1-7. An oral hearing took place on November 6, 2007.

We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Claims 1 and 5 are illustrative of the invention and are reproduced below:

1. A power steering hose comprising:

an inner rubber layer,

an outer rubber layer,

at least two reinforcing layers inserted between the inner and outer rubber layers, and

an intermediate rubber layer interposed between the adjacent reinforcing layers, the reinforcing layers composed of twisted cords of organic fibers,

wherein the twisted cords have an intermediate elongation at 0.85cN/dtex of 2.2 to 5.0%, an elongation at break of 8 to 19% and a number of twists of 15 to 30/10 cm, respectively.

5. The power steering hose according to any one of claims 1, 2 and 3, wherein the twisted cords have a double-twist structure in which a plurality of primary twisted cords is twisted together with final twists in a same twisted direction of the primary twisted cords.

The Examiner relies on the following prior art references to show unpatentability:

Randle	3,011,525	Dec. 5, 1961
Kuribayashi	5,371,153	Dec. 6, 1994
Ikeda	5,660,210	Aug. 26, 1997

The Examiner made the following rejections:

1. Claims 1-4, and 6 under 35 U.S.C. § 103 as unpatentable over Randle in view of Ikeda.

2. Claims 5 and 7 under 35 U.S.C. § 103 as unpatentable over Randle in view of Ikeda and further in view of Kuribayashi.

Appellants state that the following groups of claims stand or fall together: (1) claims 1-4 and 6 and (2) claims 5 and 7. (Br. 5). Accordingly, we decide the first ground of rejection on the basis of claim 1 and the second ground of rejection on the basis of claim 5.

*Rejection of claims 1-4, and 6 under 35 U.S.C. § 103 as unpatentable over
Randle in view of Ikeda*

The Examiner found that Randle discloses the invention as claimed in claim 1 with the exception of twisted cords having “an intermediate elongation at 0.85 cN/dtex of 2.2 to 5.0%” and “an elongation at break of 8 to 19%.” The Examiner further found that Ikeda discloses that “the elongation values of the threads forming the reinforcing layers of the rubber hoses having the structure similar to Randle et al are important and are optimized based on the desired physical properties of the final article.” (Ans. 5). The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Randle’s hose by selecting “the optimum elongation at break and intermediate elongation value at 0.85 cN/dtex within the claimed ranges depending on the intended end result of the hose with regards to volume expansion, fatigue resistance, and tensile strength, as taught by Ikeda.” (Ans. 6).

Appellants contend that one of ordinary skill in the art would not have had a reasonable expectation of success in achieving the degree of durability and vibration damping required in a power steering hose simply by optimizing features (i.e., elongation values) taught by Ikeda as useful for improving fatigue resistance and reducing volume expansion in a conventional layered rubber hose. (Reply Br. 3).

The issue presented is: Has the Examiner established that one of ordinary skill in the art would have been motivated to modify Randle's hose based on Ikeda's disclosure to achieve a hose having a reinforcing layer composed of twisted cords having the claimed elongation values?

The following enumerated findings of fact are relevant to our consideration of this issue:

- 1) Randle discloses a high pressure flexible hose comprising an inner rubber layer 5, an outer rubber layer 10, a braided filament layer 7 of polyethylene terphthalate applied to the inner layer and a braided sleeve 9 of rayon filaments adjacent the outer layer 10 and an intermediate layer 8 constructed of a flexible, resilient material such as rubber between the braided layers 7 and 9. (Col. 2, ll. 56-69). Randle discloses a specific embodiment in which the strands in layers 7 and 9 are twisted with about 6 turns per inch. (Col. 3, ll. 10-12).
- 2) According to Randle, the hose may be used in hydraulic braking installations in vehicles. (Col. 1, ll. 12-13).

- 3) Ikeda discloses a reinforced hose comprising an inner tube made of rubber, a cover layer made of rubber and formed over the inner tube, at least two reinforcing thread layers, including an upper thread layer and a lower thread layer, disposed between the inner tube and the cover layer. (Col. 2, ll. 23-31).
- 4) According to Ikeda, the “inventors conducted extensive research and development on the relationships between the various physical properties of the reinforcing threads and the fatigue resistance as well as the volume expansion of the reinforced hose. As a result, they discovered that a reinforcing thread made from a polyester thread of a specific kind satisfies the fatigue resistance and the volume expansion requirements simultaneously.” (Col. 2, ll. 3-10). Ikeda utilizes a thread layer which includes a polyester thread having a tensile strength of 8 grams or more per unit denier, an elongation of $10 \pm 1.5\%$, and a loaded elongation of $2.7 \pm 1.0\%$ per unit denier under 3-gram load. (Col. 2, ll. 32-37).
- 5) According to Ikeda, “fatigue resistance refers to the durability of the reinforced hoses when they are repeatedly flexed at a high temperature while they are repeatedly subjected to a high pressure. Volume expansion refers to the variation of the inner volume of reinforced hoses when a highly pressurized fluid is supplied to them.” (Col. 1, ll. 38-44).

- 6) Ikeda discloses that when elongation at break is decreased fatigue resistance decreases and when elongation at break increases, tensile strength decreases. Ikeda further discloses that when intermediate elongation is increased, the hose exhibits a larger volume expansion and when intermediate elongation decreases, tensile strength decreases. (Col. 2, ll. 44 – col. 3, ll. 5).
- 7) According to the present Specification, it was known in the art at the time of the invention that expansion of a power steering hose reduces vibrations transmitted to the steering wheel and passenger compartment. (Spec. [0004]).

“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product . . . of ordinary skill and common sense.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007). Appellants contend that, in the present case, one of ordinary skill in the art would not have had a reasonable expectation of success in achieving the claimed power steering hose because (1) Ikeda is directed to optimization of conventional rubber hoses, and neither Randle nor Ikeda specifically mention power steering hoses (Reply Br. 3) and (2) “the intermediate elongation of [Ikeda’s] reinforcing cord is so small or low that it can never be possible to obtain the vibration-preventive result or the high durability attainable according to the hose of the claimed invention.” (Reply Br. 4).

We have considered Appellants' arguments. However, we find that the preponderance of the evidence weighs in favor of the Examiner's conclusion of obviousness for the reasons well-stated in the Answer.

With respect to Appellants' first argument, we note that although Randle and Ikeda do not specifically mention power steering hoses (*see* Findings of Fact 1 & 3), they are clearly concerned with controlling fatigue resistance and volume expansion of a hose (*see* Findings of Fact 2 & 4). As properly pointed out by the Examiner, Ikeda discloses that fatigue resistance and volume expansion may be controlled by adjusting intermediate elongation and elongation at break. (Ans. 8; Finding of Fact 6). Moreover, it was known in the art at the time of the invention that fatigue resistance and volume expansion affect durability and vibration. (Findings of Fact 5 & 7). Thus, in our view, the facts weigh in favor of the Examiner's conclusion that one of ordinary skill in the art would have had a reasonable expectation of success in achieving optimum vibration damping and durability in a power steering hose by optimizing those variables effecting fatigue resistance and volume expansion as taught by Ikeda. *See In re Woodruff*, 919 F.2d 1575, 1577-78 (Fed. Cir. 1990).

We do not find Appellants' second argument persuasive because it is based on an unreliable estimate of the elongation values for Ikeda's thread (App Br. 7). More specifically, Appellants' estimate is not supported by credible evidence, such as an expert declaration, *see, Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (noting that the fact finder is not required to credit unsupported or conclusory assertions), and is admittedly based on an assumption. (App. Br. 7). Appellants have not explained the basis for this assumption and, therefore, we have no idea whether it is a valid assumption. We also note that Ikeda's elongation values appear to relate to the individual threads or fibers. (Finding of Fact 4). Thus, even if Appellants' estimate is correct, it does not provide a proper basis for comparison to the claimed elongation values for twisted cords, which comprise a plurality of threads or fibers.

A prima facie case of obviousness may be rebutted by evidence of unexpected results or a showing that the prior art teaches away from the claimed invention in any material respect. *In re Geisler*, 116 F.3d 1465, 1469-70 (Fed. Cir. 1997). In the present appeal, Appellants rely on comparative data in the Specification as evidence that the claimed invention provides unexpected results.¹ Thus, a second issue before us is: Does Appellants' evidence of nonobviousness outweigh the evidence of obviousness relied upon by the Examiner?

¹ Appellants' evidence of unexpected results is raised in the Reply Brief and is not commented on by the Examiner. However, we note that the burden of analyzing and explaining data to support an argument of unexpected results rests on the party asserting it. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972).

In order to show unexpected results, evidence must be commensurate in scope with the claims. Appellants' evidence does not satisfy this requirement because the data presented in the Specification is limited to cords having a number of twists of 20/10 cm, although the claimed range is 15-30/10 cm. In addition, the elongation at break of the exemplary cords ranges from 15.9 to 18.5%, although the claimed range is 8 to 19%. (Spec., Table 1). *See In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005)². *See also, In re Costello*, 480 F.2d 894, 897 (CCPA 1973).

Therefore, we conclude that Appellants' evidence of unexpected results does not outweigh the Examiner's prima facie showing of obviousness.

*Rejection of claims 5 and 7 under 35 U.S.C. § 103 as unpatentable over
Randle in view of Ikeda and further in view of Kuribayashi*

² ("The Board also correctly reasoned that the showing of unexpected results is not commensurate in scope with the degree of protection sought by the claimed subject matter because the elemental composition of CMSX®-486 is at or near the midpoint of the claimed range. While Harris's evidence may show a slight improvement over some alloys, the record does not show that the improved performance would result if the weight-percentages were varied within the claimed ranges. Even assuming that the results were unexpected, Harris needed to show results covering the scope of the claimed range.")

The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected a double-twist structure as the twisted cords of the Randle/Ikeda power steering hose “depending on the intended end result of the hose since double-twist structures are used as twisted cords in formation of braided reinforcement layers for rubber hoses, as taught by Kuribayashi.” (Ans. 7).³ Appellants contend that Kuribayashi fails to teach or suggest “a plurality of primary twisted cords is twisted together with final twists in the same twist direction of the primary twisted cords.” (Reply Br. 10). The issue presented is: Has the Examiner has provided sufficient facts and reasons to establish that the combined teachings of Randle/Ikeda and Kuribayashi disclose or suggest twisted cords having the structure recited in claim 5?

The following additional enumerated findings of fact are relevant to our consideration of this issue:

- 8) Kuribayashi discloses a process for producing aromatic polyamide fibers for reinforcement of rubbers. (Abstract). Kuribayashi discloses that the invention relates, in particular, to fiber reinforced rubbers used in tires, belts, hoses, and the like. (Col. 1, ll. 10-13).
- 9) In Example 1, Kuribayashi discloses formation of a reinforcing layer using double twist cords.

³ The Examiner mailed a Supplemental Examiner’s Answer correcting a typographical error in the rejection of claims 5 and 7 “in which ‘Inada’ was inadvertently typed when the intention was ‘Kuribayashi’.” (Supp. Answer 2). For convenience, we refer to the page numbering in the original Answer.

“When the PTO shows sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.” *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990). The Examiner found that the fibers disclosed in Kuribayashi have the structure recited in claim 5. (Ans. 6-7). In our view, the Examiner’s finding is supported by Kuribayashi’s disclosure and, therefore, the Examiner properly shifted the burden to Appellants to show that the claimed invention patentably distinguishes over Kuribayashi. Appellants have not presented the requisite evidence to satisfy this burden. *See In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) (argument by counsel cannot take the place of evidence).

ORDER

The decision of the Examiner rejecting claims 1-4 and 6 under 35 U.S.C. § 103 as unpatentable over Randle in view of Ikeda is affirmed.

The decision of the Examiner rejecting claims 5 and 7 under 35 U.S.C. § 103 as unpatentable over Randle in view of Ikeda and further in view of Kuribayashi is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(i)(iv).

AFFIRMED

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PATRICK G. BURNS
GREER, BURNS & CRAIN, LTD.
SUITE 2500
300 SOUTH WACKER DRIVE
CHICAGO, IL 60606